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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,266	11/17/2006	Alessandro Casalini	282367US0X PCT	5853
22850	7590	11/28/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER SALVITTI, MICHAEL A	
			ART UNIT	PAPER NUMBER
			4131	
			NOTIFICATION DATE	DELIVERY MODE
			11/28/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/561,266	<b>Applicant(s)</b> CASALINI ET AL.	
	<b>Examiner</b> MICHAEL SALVITTI	<b>Art Unit</b> 4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/19/2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Objections*

1. Claim 10 is objected to because of the following informalities: "1 to 400 by weight" should read as "1 to 40% by weight" to show consistency with independent claims 1 and 9; otherwise the term is unitless and ambiguous in meaning. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,493,922 to *Echte et al.*, as evidenced by U.S. Patent No. 5,039,714 to *Kasahara et al.*

In '922, *Echte* teaches the synthesis of impact-resistant polystyrenes containing bimodal rubber additives (column 1, lines 35-55). The specification of '922 discloses the synthesis of composition with overlapping ranges for all components of the elastomeric polymer composition.

With regard to claim 1, the polymer of '922 contains 70-97% by weight of the polystyrene matrix (column 1, lines 41-43); 60-95% by weight of polybutadiene capsule (a.k.a. "core-shell" as specified by the instant claim 1, see column 1, lines 47-48 of '922), having a size of 0.2-0.6  $\mu\text{m}$ ; and 5-40% of polybutadiene "cell and/or coil" particles (see column 1, lines 54-55; particles having a cellular morphology are known in the art to be "salami particles" (see '714, column 2, lines 55-56) as defined by instant claim 1). The salami particles have a size of 2-8  $\mu\text{m}$  (column 1, lines 49-50). These components constitute overlapping ratios with instant claim 1, and overlapping ranges have been held to establish prima facie obviousness. See MPEP 2144.05. Butyl rubber (polybutadiene), which was used in '922, is admitted by the applicant to have a known Hildebrand parameter of  $\delta=7.8$  (see page 12, lines 5-12 of instant specification) which has a minimum of 0.5. As defined by the specification (page 11, line 14 through page 12, line 4), this property makes the particles incompatible.

The preferred elastomer sizes of instant claim 2 overlap the sizes proposed by *Echte* (column 1, lines 47-50). As to claim 3, an olefinic (styrene) homopolymer is disclosed as the matrix polymer in which the particulates are dispersed (column 1, line 39).

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4. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,493,922 to *Echte et al.* as applied to claims 1 and 3 above, and further in view of U.S. Patent No. 6,545,090 to *Demirors et al.*

Patent '922 discloses the features found in claims 1-3, but does not disclose the use of a styrene-butadiene matrix, specific molecular weights of the polymers, specific weight percentages and physical properties, as instant claims 4-8 recite.

Patent '090 teaches a styrene-butadiene block copolymer rubber which is utilized as a high impact polystyrene (HIPS) substrate. This synthetic method teaches a two component polymer matrix: the first component is a butadiene polymer having a high molecular weight component of 100,000 to 1,000,000 (column 4, line 11) and a low molecular weight styrene component with a molecular weight of 60,000-80,000 (column 5, lines 8-17). The styrene block contains 20 to 80% by weight of the copolymer (column 5, lines 18-24). Regarding claims 6 and 8, the viscosity is around 150 centipoise (column 4, lines 12-24).

The two prior art disclosures are analogous art; these publications deal with the synthesis of rubber-modified HIPS-type polymers. *Demirors* suggests that the embodiment disclosed in '090 exhibits a balance of impact and tensile strength (column 2, lines 12-14). At the time of invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of '922 and '090 to make a HIPS polymer which has a balance of tensile strength and impact strength.

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5. Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,493,922 to *Echte et al.* further in view of U.S. Patent No. 6,545,090 to *Demirors et al.*

*Echte et al.* discloses a composition that renders obvious the polymer recited in instant claim 9, but fails to teach a method that renders obvious claims 9-16.

As to claims 9, 12-13 and 15-16, *Demirors* dissolves 5-10 weight % of rubber components (column 9, lines 5-6) containing the specified ratios (column 5, lines 18-24). The rubber particles are dissolved in a monomer/rubber mixture (column 6, lines 54-68). This reaction occurs between 60-190°C in the presence of 0.001-0.5% chain transfer agents (column 10, lines 6-17). The product is recovered by removing unreacted monomers (column 10, lines 17-20). An initiator is used at 100-1,500 ppm (0.01 to 0.15% by weight, see column 8, lines 37-47).

As to claim 11, as applied to claim 9 above, *Demirors* discloses alkyl and halogenated styrenyl derivatives of the invention (column 3, lines 25-54).

Regarding claims 10 and 13, *Demirors* does not specifically disclose a pre-polymerization occurring at less than 100°C, but rather suggests it by stating that the polymerization stage can begin at as low as 60°C, and the temperature can be raised as high as 190°C (column 10, lines 13-17). '090 discloses other additives (column 9 lines 61-68 and column 10, lines 1-5). As to claim 14, a reaction pressure is not specified, but the high temperature conditions and reaction vessel/plug flow reactors typically operate between atmospheric pressure and high pressure.

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At the time of invention, it would have been obvious to one of ordinary skill in the art to prepare the polymer disclosed in '922 with the method proposed in '090, for the purpose of creating a polymer blend that contains the toughness of *Echte's* blend with the tensile strength and synthetic method proposed by *Demirors*.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- 5,179,166 to Demirors discloses a similar composition, but utilizes higher molecular weight components.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL SALVITTI whose telephone number is (571)270-7341. The examiner can normally be reached on Monday to Friday 8AM to 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/  
Supervisory Patent Examiner  
Art Unit 4131

M.S.